#5

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Hidehito IISAKA

Group Art Unit: Unknown

Application No.: 10/062,441

Examiner: Unknown

Filed: February 5, 2002

Docket No.: 111830.01

For: SYSTEM AND METHODS FOR DRIVING AN ELECTROOPTIC DEVICE (AS AMENDED)

PRELIMINARY AMENDMENT

Director of the U.S. Patent and Trademark Office
Washington, D. C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE TITLE:

Please replace the title as follows:

SYSTEM AND METHODS FOR DRIVING AN ELECTROOPTIC DEVICE

IN THE ABSTRACT:

Please replace the Abstract filed with the substitute Abstract attached hereto.

IN THE SPECIFICATION:

Please replace the specification filed with the substitute specification attached hereto.

IN THE CLAIMS:

Please replace claims 1-36 as follows:

1. (Amended) A drive circuit of an electrooptic device that supplies a display portion wherein pixels are constructed in a matrix shape out of an electrooptic material having a transmission factor for light that is variable by application of a voltage, with an ON

voltage capable of saturating the transmission factor or an OFF voltage capable of bringing the electrooptic material into a non-transmissive state, thereby to implement a subfield drive in which a gradation is expressed in accordance with states of a light transmissive state and the non-transmissive state of the electrooptic material in a unit time, and a time ratio of the states, the drive circuit comprising:

a drive device that sets as control units a plurality of subfields into which a field period is divided on a time base, sets a time period of each of the subfields to be shorter than a saturation response time which is required for saturating the transmission factor of the electrooptic material in the case of applying the ON voltage, and determines, on the basis of display data, the subfields for which to apply the ON voltage and the subfields for which to apply the OFF voltage, thereby to express the gradation.

2. (Amended) A drive circuit of an electrooptic device according to Claim 1, the saturation response time of the electrooptic material being shorter than a field period of the display data.

3. (Amended) A drive circuit of an electrooptic device that supplies a display portion wherein pixels are constructed in a matrix shape out of an electrooptic material having a transmission factor for light that is variable by application of a voltage, with an ON voltage capable of saturating the transmission factor or an OFF voltage capable of bringing the electrooptic material into a non-transmissive state, thereby to implement a subfield drive in which a gradation is expressed in accordance with states of a light transmissive state and the non-transmissive state of the electrooptic material in a unit time, and a time ratio of the states, the drive circuit comprising:

a drive device that sets as control units a plurality of subfields into which a field period is divided on a time base, sets a time period of each of the subfields to be shorter than a non-transmission response time which is required for shifting the transmission factor

of the electrooptic material from a saturated state into the non-transmissive state in the case of applying the OFF voltage, and that determines, on the basis of display data, the subfields for which to apply the ON voltage and the subfields for which to apply the OFF voltage, thereby to express the gradation.

4. (Amended) A drive circuit of an electrooptic device according to Claim 3, the non-transmission response time of the electrooptic material being shorter than a field period of the display data.

5. (Amended) A drive circuit of an electrooptic device according to Claim 1, the drive device applying the ON voltage to the electrooptic material in successive or non-successive subfields so that an integral value of a transmissive state of the electrooptic material in a pertinent field period corresponds to the display data.

6. (Amended) A drive circuit of an electrooptic device according to Claim 1, the plurality of subfields within each field being set at substantially the same time width.

7. (Amended) A drive circuit of an electrooptic device according to Claim 1, the saturation response time being a time period which is not shorter than three subfield periods.

8. (Amended) A drive circuit of an electrooptic device according to Claim 1, the non-transmission response time being a time period which is not shorter than three subfield periods.

9. (Amended) A drive circuit of an electrooptic device according to Claim 1, the ON voltage being applied to the electrooptic material in a concentrated fashion in subfield periods on a lead side of the field period.

10. (Amended) A drive circuit of an electrooptic device according to Claim 3, the OFF voltage being applied to the electrooptic material in a concentrated fashion in subfield periods on a end side of the field period.

11. (Amended) A drive method of an electrooptic device that supplies a display portion wherein pixels are constructed in a matrix shape out of an electrooptic material having a transmission factor for light that is variable by application of a voltage, with an ON voltage of, at least, a saturation voltage capable of saturating the transmission factor or an OFF voltage capable of bringing the electrooptic material into a non-transmissive state, thereby to implement a subfield drive in which a gradation is expressed in accordance with states of a light transmissive state and the non-transmissive state of the electrooptic material in a unit time, and a time ratio of the states, the method comprising:

setting as control units a plurality of subfields into which a field period is divided on a time base;

setting a time period of each of the subfields to be shorter than a saturation response time which is required for saturating the transmission factor of the electrooptic material in the case of applying the ON voltage; and

determining on the basis of display data the subfields for which to apply the ON voltage and the subfields for which to apply the OFF voltage therein, thereby to express the gradation.

12. (Amended) A drive method of an electrooptic device that supplies a display portion wherein pixels are constructed in a matrix shape out of an electrooptic material having a transmission factor for light that is variable by application of a voltage, with an ON voltage of, at least, a saturation voltage capable of saturating the transmission factor or an OFF voltage capable of bringing the electrooptic material into a non-transmissive state, thereby to implement a subfield drive in which a gradation is expressed in accordance with states of a light transmissive state and the non-transmissive state of the electrooptic material in a unit time, and a time ratio of the states, the method comprising:

setting as control units a plurality of subfields into which a field period is divided on a time base;

setting a time period of each of the subfields to be shorter than a non-transmission response time which is required for shifting the transmission factor of the electrooptic material from a saturated state into the non-transmissive state in the case of applying the OFF voltage; and

determining on the basis of display data the subfields for which to apply the ON voltage and the subfields for which to apply the OFF voltage, thereby to express the gradation.

13. (Amended) A drive method of an electrooptic device according to Claim 11, the gradation being expressed by applying the ON voltage to the electrooptic material in successive or non-successive subfields so that an integral value of the transmissive state of the electrooptic material in the pertinent field period corresponds to the display data.

14. (Amended) A drive method of an electrooptic device that divides each field into a plurality of subfields on a time base, and controls and drives a plurality of pixels which include an electrooptic material enclosed in intersection areas between a plurality of data lines and a plurality of scanning lines, by an ON voltage or an OFF voltage every subfield in accordance with display data, whereby the respective pixels display gradations within one field, the method comprising:

setting a time period of each of the subfields to be shorter than a saturation response time which is required for saturating the transmission factor of the electrooptic material in the case of applying the ON voltage; and

determining, on the basis of the display data, the subfields for which to apply the ON voltage and the subfields for which to apply the OFF voltage.